Claims

1. A system for monitoring an eye, said system comprising:

a video imaging camera oriented to generate images of an eye, wherein the camera is aligned along an imaging axis;

a first light source located at an angle less than 2.5 degrees from the imaging axis for illuminating the eye;

a second light source arranged at an angle greater than 4.5 degrees from the imaging axis for illuminating the eye; and

a processor for processing the images generated with the video imaging camera during illumination of the eye with the first light source, and during illumination of the eye with the second light source.

2. The system as defined in claim 1, wherein the first light source comprises a first plurality of light emitting diodes arranged substantially in a line.

3. The system as defined in claim2, wherein the second light source comprises a second plurality of light emitting diodes arranged substantially in a line.

4. The system as defined in claim 1, wherein the first light source is substantially coaxial with the video imaging camera such that the first image captures a bright eye pupil effect, and the second light source is substantially non-coaxial with the video imaging camera such that the second image captures a dark eye pupil effect.

5. The system as defined in claim 1, wherein the video imaging camera generates a first image of the eye when the first light source is illuminated, and subsequently generates a second image of the eye when the

second light source is illuminated so as to obtain dark and bright images of a pupil of the eye.

6. The system as defined in claim 1, wherein the processor controls the first and second light sources to turn at least one of the first and second light sources on and off.

7. The system as defined in claim 1, wherein the video imaging camera comprises a CMOS imager.

8. The system as defined in claim 1, wherein the first light source is arranged at an angle less than 2.3 degrees from the imaging axis, and the second light source is arranged at an angle greater than 4.6 degrees from the imaging axis.

9. The system as defined in claim 1, wherein the system is employed in a vehicle for monitoring the eye of a driver of the vehicle.

10. The system as defined in claim 1, wherein the first light source and second light source generate light illumination at substantially the same frequency.

11. A vehicle eye monitoring system for monitoring an eye of a person in a vehicle, said system comprising:

a video imaging camera located on a vehicle and oriented to generate images of an eye of a person in the vehicle, wherein the camera is aligned along an imaging axis;

a first light source located on the vehicle and arranged at an angle less than 2.5 degrees from the imaging axis for illuminating the eye;

a second light source located on the vehicle and arranged at an angle greater than 4.5 degrees from the imaging axis for illuminating the eye; and

a processor for processing the images generated with the video imaging camera during illumination of the eye with the first light source, and during illumination of the eye with the second light source.

12. The system as defined in claim 11, wherein the first light source comprises a first plurality of light emitting diodes arranged substantially in a line.

13. The system as defined in claim 12, wherein the second light source comprises a second plurality of light emitting diodes arranged substantially in a line.

14. The system as defined in claim 11, wherein the first light source is substantially coaxial with the video imaging camera such that the first image captures a bright eye pupil effect, and the second light source is substantially non-coaxial with the video imaging camera such that the second image captures a dark eye pupil effect.

15. The system as defined in claim 11, wherein the video imaging camera generates a first image of the eye when the first light source is illuminated, and subsequently generates a second image of the eye when the second light source is illuminated so as to obtain dark and bright images of a pupil of the eye.

16. The system as defined in claim 11, wherein the processor controls the first and second light sources to turn at least one of the first and second light sources on and off.

17. The system as defined in claim 11, wherein the video imaging camera comprises a CMOS imager.

18. The system as defined in claim 11, wherein the first light source is arranged at an angle less than 2.3 degrees from the imaging axis, and the second light source is arranged at an angle greater than 4.6 degrees from the imaging axis.

19. The system as defined in claim 11, wherein the first light source and second light source generate light illumination at substantially the same frequency.

20. A method for monitoring an eye, said method comprising the steps of:

arranging a video imaging camera oriented along an imaging axis to generate images of an eye;

arranging a first light source at an angle less than 2.5 degrees from the imaging axis;

arranging a second light source at an angle greater than 4.5 degrees from the imaging axis;

illuminating an eye with the first light source;

generating a first image of the eye while the eye is illuminated with the first light source;

illuminating the eye with the second light source;

generating a second image of the eye while the eye is illuminated with the second light source; and

processing the first and second images.

21. The method as defined in claim 20 further comprising the step of turning off the first light source when the second light source is

illuminated, and turning off the second light source when the first light source is illuminated.

22. The method as defined in claim 20, wherein the step of arranging the video imaging camera, first light source, and second light source comprises arranging a first row of light emitting diodes as the first light source, and arranging a second row of light emitting diodes as the second light source.

23. The method as defined in claim 20, wherein the method is employed for monitoring the eye of a driver of an automotive vehicle.

24. The method as defined in claim 20, wherein the first light source and second light source generate light illumination at substantially the same frequency.